

Application No.: 10/553,748

Amendments to the Drawings:

Figure 6 has been amended to include a bracket to indicate that (a) and (b) of Fig. 6 correspond to one drawing together. The amendment to Fig. 6 is shown in the attached Replacement Sheet.

REMARKS

This Amendment is being filed in response to the Office Action dated October 26, 2006. In view of these amendments and remarks this application should be allowed and the case passed to issue. No new matter is introduced by this amendment. Support for new claims 20-32 is found throughout the specification. Claims 20 and 21 are supported by the specification at page 6, lines 15-26; page 7, lines 20-28; and Fig. 1, which clearly teach the plate-shaped spring structure. Support for new claims 22-25 is found at page 4, lines 2-9 of the specification. New claims 26 and 27 are supported by the specification at page 4, line 27 to page 5, line 4. New claims 28-32 are supported by page 5, lines 5-10 of the specification.

Claims 20-32 are pending in this application. Claims 1 and 2 are rejected. Claims 3-19 were withdrawn pursuant to a restriction and election of species requirement. Claims 1-19 are canceled in this response. New claims 20-32 have been added.

Restriction

New claims 20-32 belong to the elected Group I, Species 1. Independent claim 20 is directed to a terminal and claims 21-32 depend from claim 20. Furthermore, new claims 20-32 read on the elected species of Fig. 1a. Claim 20 is generic.

Claim Rejections Under 35 U.S.C. § 102

Claims 1 and 2 were rejected under 35 U.S.C. § 102(b) as being anticipated by Zhang et al. (U.S. Pat. No. 6,447,343). This rejection is traversed, and reconsideration and withdrawal thereof respectfully requested. The following is a comparison between the invention as claimed, and the cited prior art.

Claims 1 and 2 have been canceled, thus the rejection of these claims is moot. Applicant further submits that new claims 20-32 are not anticipated by Zhang et al. because Zhang et al. do

not disclose a micro terminal comprising a columnar contactor, wherein the contactor has a plate-shaped spring structure and a perimeter portion of said spring structure has a tubular ring structure, as required by claim 20.

Zhang et al. disclose a terminal 3 including a cylindrical contactor, as shown in Fig. 4. This cylindrical contactor includes a wire-like spiral spring 34. In contrast, the contactor required by claim 20 of the present invention includes a columnar spring 1u, wherein the perimeter portion 1ug has a tubular ring structure, as shown in Fig. 1(a) and Fig. 1(b). The contactor of the present invention differs from the contactor disclosed by Zhang et al. in that the spring (1u) is plate-shaped.

Because the perimeter portion 1ug of the contactor required by claim 20 has a tubular ring structure, it can be easily mounted on a substrate and the micro terminal can be grasped easily, allowing a firm holding. Further, the absence of the side end portion of a spiral spring at the perimeter is advantageous in that the substrate will not be scratched away by the side end portion of the spiral spring even if contact with an electrode is repeated, leading to high stability (see page 7, lines 20 - 25).

The contactor of the present invention has a plate-shaped spring structure allowing reduced size contactors to be formed with an outer diameter D not more than 1 mm, and a thickness b of spiral spring 1u in the range of $100\ \mu\text{m}$ – $500\ \mu\text{m}$, as shown in Fig. 1 (see page 7, lines 26 - 28). Springs having an aspect ratio (b/a) of at least 2 to at least 30 can be readily fabricated. Because the present invention allows a high aspect ratio to be achieved, the width a of the spring can be made smaller and the number of spirals can be increased to provide a larger stroke. Further, the thickness b of the spring can be increased to allow a larger contact load. Thus, a micro terminal having high connection reliability can be fabricated. Specifically, a

micro terminal with a stroke of at least 100 μm and a contact load of 0.03N can be readily fabricated. A contact load of at least 0.1N can also be achieved. Thickness b can be increased even when the width a of the spring is reduced, so that a current of at least 0.5A can be conducted (see page 10, lines 12 - 24).

The factual determination of lack of novelty under 35 U.S.C. § 102 requires the disclosure in a single reference of each element of a claimed invention. *Helifix Ltd. v. Blok-Lok Ltd.*, 208 F.3d 1339, 54 USPQ2d 1299 (Fed. Cir. 2000); *Electro Medical Systems S.A. v. Cooper Life Sciences, Inc.*, 34 F.3d 1048, 32 USPQ2d 1017 (Fed. Cir. 1994); *Hoover Group, Inc. v. Custom Metalcraft, Inc.*, 66 F.3d 399, 36 USPQ2d 1101 (Fed. Cir. 1995); *Minnesota Mining & Manufacturing Co. v. Johnson & Johnson Orthopaedics, Inc.*, 976 F.2d 1559, 24 USPQ2d 1321 (Fed. Cir. 1992); *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051 (Fed. Cir. 1987). Because Zhang et al. do not disclose a micro terminal comprising a columnar contactor, wherein the contactor has a plate-shaped spring structure and a perimeter portion of said spring structure has a tubular ring structure, as required by claim 20, Zhang et al. do not anticipate claim 20.

Applicant further submits that Zhang et al. do not suggest the claimed micro terminal.

The dependent claims are allowable for at least the same reasons as claim 20 and further distinguish the claimed invention.

In view of the above amendments and remarks, Applicant submits that this application should be allowed and the case passed to issue. If there are any questions regarding this Amendment or the application in general, a telephone call to the undersigned would be appreciated to expedite the prosecution of the application.

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To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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